Mechanical Engineering and Mechanics

MEM 435 Introduction to Cad/CAM Fall, Spring, 2006-2007

Designation:	Required		
Catalog Description:	Provide students with an introduction and theoretical understanding of enabling computer-aided technologies in design (CAD), manufacturing (CAM) and product development, and with a hand-on experience to use integrated CAD/CAE/CAM software for engineering design, analysis and manufacturing through lectures, laboratories, and final team project.		
Prerequisites :	MEM 201: Fundamentals of CAD		
Textbook(s) and oth	er required material:		
Required:	Textbook: "Principles of CAD/CAM/CAE Systems", by Kunwoo Lee, Addison-Wesley, 1999		

Addison-Wesley, 1999 Lab Tutorial: "Pro/Engineer Tutorial, Wildfire 3.0", by Roger Toogood, SDC Publication, <u>www.SDCpro.com</u> Web Page : <u>http://www.pages.drexel.edu/~sunwei/MEM435-</u> <u>CAD/CAM/MEM435-001-Fall-AY0607.htm</u>

Course Objectives:

- 1. Knowledge on modern computer-aided technologies
- 2. Familiarity with enabled CAD, CAE and CAM in design and manufacturing
- 3. A working experience using the selected CAD/CAM software
- 4. An ability of developing 3D CAD modeling and solid modeling
- 5. An ability of developing CAM part program for CNC machining
- 6. An ability of using rapid prototyping technique for design representation
- 7. An ability to use an integrated CAD/CAE/CAM and RP techniques for engineering design and product development

Topics:

- 1. Introduction to design, design modeling, and model-based design and simulation
- 2. Role of CAD/CAE/CAM in modern design and manufacturing
- 3. Introduction to 3D CAD and integrated CAD/CAE/CAM system
- 4. Geometric modeling, solid modeling, and feature-based design modeling
- 5. Introduction to CAM and CAD/CAM interface
- 6. Introduction to CNC and part programming
- 7. Introduction to Solid Freeform Fabrication
- 8. Introduction to standards for CAD data exchange

Class Schedule: 1.5 hour lecture and 3 hours of lab/week (4 credit)

Contribution to Professional Component:

The MEM 435 is designed to provide students with an advanced knowledge and skill in using integrated CAD/CAE/CAM technology for their professional development, and provide them with the understanding of the impact of Information Technology on modern design and manufacturing.

Relationship to Program Outcomes:

Criteria a - k	Content	Explanation	Evidence
a . An ability to apply	2	This course requires the students to have	Textbook,
knowledge of mathematics,		knowledge of engineering and design, as well as	lecture notes,
science and engineering.		the application of the knowledge in engineering	homework and
		practice. The students learn how to use CAD as a	project
		design tool in the design process.	assignment
b . An ability to design and	1	The course provides lectures and labs to training	Textbook,
conduct experiments as well		students to use integrated design and analysis	lecture notes,
as		approach and tools to conduct design. Due to the	homework and
to analyzed and interpret		nature of the course, no experimental work has	project
data.		been involved into the course.	assignment
c. An ability to design a	2	The design oriented lab and assigned design	Homework,
system, component or		problems are intended to provide a good training	final project and
process to meet		for students in this regards, particularly for them	project
desired needs.		to learn use integrated design, analysis and	presentation
		manufacturing approach for engineering design	
		and product development.	
d. An ability to function on	0	N/A	N/A
multidisciplinary teams.			
e. An ability to identify,	2	The design problems train the students to	Homework and
formulate and solve		formulate and solve engineering problems.	final project
engineering problems.			
f. An understanding of	1	The design oriented lab and assigned design	Classroom
professional and ethical		problems are intended to training students to learn	discussion,
responsibility.		use integrated design, analysis and manufacturing	lecture notes,
		approach for engineering design and product	and final project
A 1.11.	1	development.	0
g. An ability to communicate	1	The course focuses on the lab experience and the	Group project
effectively.		oral presentation of final design project.	and project
h The breed advection	0		presentation
n. The broad education	U	N/A	N/A
import of an air a given and the			
impact of engineering			
solutions in a global/societal			
i A recognition of the need	1	This has been emphasized for students to be	Lecture and
for and an ability to engage		aware of the rapid change of the computer	classroom
in lifelong learning		software they learnt and the importance to cope	discussions
in metong learning		with these changes by lifelong learning	alseassions
i. A knowledge of	2	Latest CAD/CAM/CAE knowledge and software	Homework and
contemporary	_	are introduced in the class.	lab assignment.
issues			lecture notes
k. An ability to use the	2	Students apply their CAD/CAM knowledge and	Lab and
techniques, skills and		skill in their design practices, the co-op job, and	homework
modern engineering tools		their continuing professional development.	assignments,
necessary for engineering			final project
practice			I J
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0 = No content; 1 = Some content; 2 = Significant content

Prepared by:

Dr. Wei Sun, 5 November 5, 2006